NUMBER 57—2

Kodak Professional Notes

For Registered Owners of:
Kodak Color, Industrial, and Professional Handbooks

KEYS TO COLOR PRINTING, Part VII

(Type C Contrast Control)

"Why," you have probably heard someone ask, "is Kodak Color Print Material, Type C, available in just one grade of contrast?" And the answer is that usually that's all you'll need. In black-and-white photography, subject textures and shapes are rendered—"differentiated" is a better term—only by tonal differences. However, in color photography, there are not only tonal differences, but there are color differences as well. Thus, the color differences help to provide much of the separation that is supplied by various contrast grades in monochrome printing.

Every once in a rare while, though, there is a high-contrast color subject that would be better if it were printed with less contrast than the Type C Material normally affords. A typical subject of this type is a back-lighted outdoor portrait in which fill-in flash was not used or a scene characterized by a deep-woods-with-strong-sunlight type of lighting, which we all encounter occasionally. Although it is true that some improvement can often be effected by ordinary dodging techniques, this may not solve the problem.

Fortunately, there is a comparatively simple method of reducing the printing contrast of such negatives. The technique consists in making on Kodak Pan Masking Film a weak positive mask from the color negative by contact printing. The two films are then bound in register and printed as a unit.

Here are the details: First, as a clue to the printing characteristics of a particular color negative, note that an average color negative of normal contrast (and we're speaking of contrast

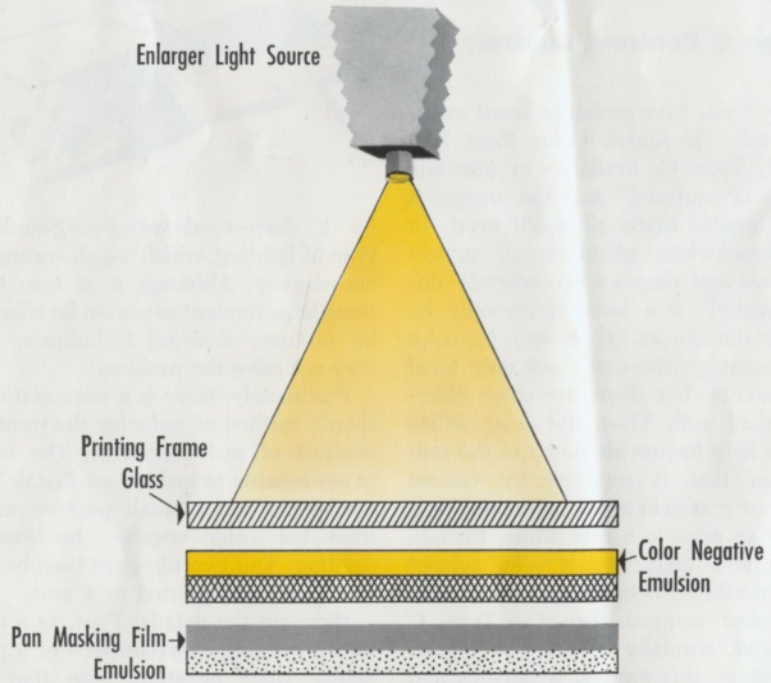
variations caused by lighting conditions, not of development contrast which is established) will produce a black-and-white print of near-normal contrast on grade No. 4 Kodabromide Paper. If, perchance, the best black-and-white print was made on grade No. 3 or 2 Kodabromide Paper, then it is a good indication that the lighting contrast of the color negative was excessively high and a positive film mask would materially assist in making a print of optimum quality.

A so-called "30 percent" mask, in which the density range of the mask is approximately 30 percent of the negative's density range, will reduce the effective printing contrast of the color negative by about 1½ to 2 grades.

The material recommended for the mask is Kodak Pan Masking Film, which yields fine-grain images that are approximately neutral in tone, even at low contrast. The emulsion is coated on a thin, low-shrinkage base in order to facilitate subsequent register.

To make a suitable mask, a sheet of Kodak Pan Masking Film is placed with the color negative in a contact printing frame so that the emulsion side of the masking film is in contact with the base side of the color negative. Thus, the exposure is made through the negative onto the masking film.

Any tungsten-source enlarger can be used conveniently as the exposing light.



This diagram shows the correct masking film—color negative relationship. The mask can be exposed, processed, and dried in less than 15 minutes.

By the following method, the mask can be exposed with sufficient accuracy and without previous testing: Adjust the enlarger height so that an exposure-meter reading of 3 foot-candles is obtained at the baseboard when the enlarger lens is set at *f*/4.5. Then stop down the lens to *f*/22 and expose the masking film for about 5 seconds. In complete darkness, process the Kodak Pan Masking Film in a tray of fresh Kodak Developer DK-50, diluted 1 to 4, at 68 F for 3 minutes with constant agitation. Rinse, fix, and wash in the usual way and dry without heat. This will result in a mask which will reduce the printing contrast approximately 1½ to 2 grades. A developing time of 2 minutes will yield a mask that will reduce the printing contrast by approximately one grade.

After the mask has been dried, a magnifying glass is used to help in registering the mask with the color negative. The two films are then bound along two adjacent edges with pressure-sensitive tape so that the emulsion side of the mask is next to the base side of the negative. When this combination is placed in the negative carrier of the enlarger, the emulsion side of the negative should be *down*, as usual.

The mask-negative combination requires about a two-times increase in exposure, due to the added density of the mask, but no change in the color-compensating filters that were found best for printing the unmasked negative. Curiously, there is an apparent increase in print sharpness due to the mask effect, but this, of course, together with the improved contrast results, is all to the good.

If you suspected that a white-light mask exposure is actually not "neutral," you're right. The two masking images of the color negative (see Keys to Color Printing, Part IV) mean that the contrast-reducing mask will be exposed by orange light. However, the effect on the print colors is very slight and can be disregarded for most subjects.

Another promising masking technique, which might be called "shadow masking," would be helpful in the following instance: Suppose you had a color negative of a subject with a high lighting contrast—a negative that seemed to call for an ordinary contrast-reducing mask, as described previously. Yet, when a "straight" contrast-reducing mask was used, it lowered the print density of the extreme shadows so that these shadow areas had a "smoky" appearance in the print.

The remedy is to make first an extremely high-contrast mask on Kodak Highlight Masking Film with an exposure adjusted so that only the deepest shadows—those devoid of any useful detail—are recorded as opaque mask densities. This film should be developed with continuous agitation for 4 minutes at 68 F in a tray of Kodak Highlight Mask Developer, full strength. This "shadow mask" is then registered with the color negative, and this combination is used to expose the soft, contrast-reducing mask on the Kodak Pan Masking Film. The shadow mask is then discarded, and only the contrast-reducing mask is used with the color negative to make the Type C print.

The printing effect would be one of reduced print contrast in highlights, middle tones and "medium" shadow areas, plus extremely good maximum density in the deepest shadows. After all, the impression of optimum print quality is often imparted by a wide print density range, and this method will certainly produce that.

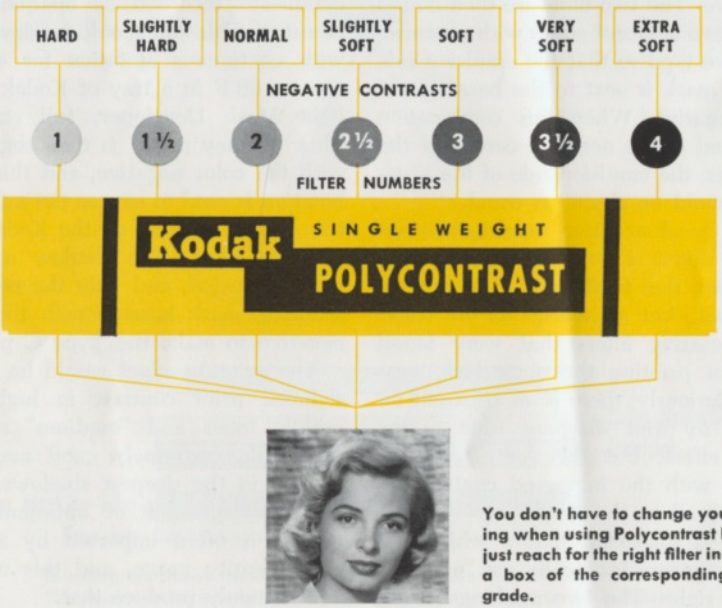
THE POLYCO

It's FANTASTIC even if you stop and think about it—one paper with a complete one-to-four contrast range in half-grade steps! For example, it's impossible to "run out of" No. 3 paper, No. 1 paper, or paper of any other grade, for that matter, if you have Kodak Polycontrast Paper on hand at all.

There are, if you haven't heard, two types of this new paper: *Polycontrast,* which has a speed suitable for use under the average enlarging conditions where a paper such as Kodak Medalist would be used, has a warm-black tone and is available in F (SW and DW) and N (SW and DW) surfaces; and *Polycontrast Rapid,* which is approximately two times faster, has a slightly colder tone than Polycontrast but is still in the warm-black tone designation and is available in F (SW), N (SW), G (DW) and Y (DW) surfaces.

We won't take the space to discuss here the bread-and-butter facts you'll find anyway in the instruction sheets accompanying the paper and the filter kit. Instead, we should like to add to your working information about these great new variable-contrast materials. For instance, we'd like you to know that:

—There is no density change from developer to fixing bath. This is important, obviously, when you are trying to match prints. Let's say that you have just made a test print of exactly the



You don't have to change your thinking when using Polycontrast Paper—just reach for the right filter instead of a box of the corresponding paper grade.

desired density. You now wish to use the test print as a quality and density guide in making a quantity run from the same negative. The wet test print can be placed in a tray of water beside the developing tray. When the subsequent prints develop up to match this sample, they can be stopped and fixed with the assurance they will *stay* matched.

—The maximum density is probably better than you have ever had available before. And we mean this even when comparing Polycontrast Paper, surface for surface, with other papers. Why? There are two interesting reasons. First, these modern emulsions have built-in characteristics which cause the shoulder part of their curves to go up and up, past the maximum density points of their predecessor papers. Secondly, Polycontrast emulsions have a built-in "anti-plumming" feature. This means that on drying, especially in hot-drum ferrotyping procedures, they won't change to a colder tone of less density.

A high maximum density is essential to good print quality—you might even say the higher, the better. It means better retention of shadow details and a more accurate reproduction of subject tones.

—Polycontrast Papers have minimum processing curl in both the developer and the wash water. By learning how to keep the expansion coefficients of the stock and the emulsion more nearly alike, the emulsion designers have made it easier for you from a processing standpoint. Thus, less tendency to curl toward the emulsion when immersed in the developer means more uniform processing and easier batch processing of several prints at a time. Further, lessened tendency to curl toward the base during washing makes possible more uniform washing.

—Then, there is freedom from wet abrasion, freaking, and many of the common processing faults. This means trouble-free processing with fewer make-overs.

But, for the moment, enough of advantages; we think you'll be particularly interested in the contrast-controlling filter situation:

You probably know that a set of seven filters, supplied as the Kodak Polycontrast Filter Kit (Model A), will provide a "one-through-four" range of contrasts in steps of half a grade each. However, suppose you have been doing some Type C color printing and already have on hand a set of Kodak Color Compensating Filters—will they work? Sure! We find that the following filters correspond quite closely to the Polycontrast Filters:

Kodak Polycontrast Filters (corresponding grade of Kodak Medalist Paper)	Equivalents in other Kodak Filters
1	CC-30Y
1½	CC-45Y
2	CC-25M
2½	CC-45M
3	CC-65M
3½	CC-85M
4	Wratten No. 34

And somebody will surely bring this up, so we may as well discuss it: Yes,

(Continued on page 15)

Photography by Rick Warner, Kodak Professional Technical Service Center

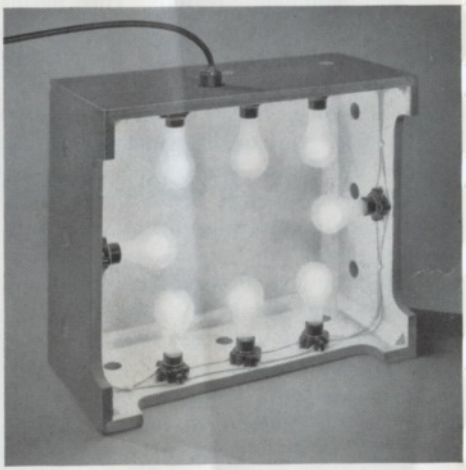
THE LIGHTBOX BACKGROUND

IN MANY INSTANCES of industrial and commercial photography, it is desirable to take a picture of a small object against a plain white background, and the first thought that may spring to mind is to place the object on a piece of white paper, light it properly, and shoot it. But just try to do it this way without forming annoying shadows that often interfere with the outline of the object! In some cases, these shadows may be so strong as to cause a serious loss in separation between the object and the background.

The remedy in the past has often included opaquing the negative. The objection to this is, of course, that retouching of any sort is time consuming and expensive. However, the shadow problem can be overcome in many instances by using a transilluminated background, such as that produced by the light box shown in the accompanying illustrations. Incidentally, this light box is not available from the Eastman Kodak Company, but, rather, is a simple do-it-yourself project. Plywood, a sheet of double-flashed opal glass, eight sockets, eight 100-watt light bulbs, wire, screws, and a plug are all the materials you'll need.

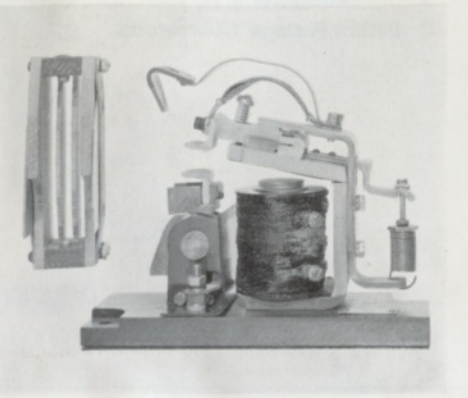
In using the light box, we think you'll find it most convenient to use the double-exposure technique rather than to try to balance the top lighting with the intensity of the background illumination. This method will give you complete freedom in arranging the subject lighting with as much or as little frontal illumination as you prefer or as the subject may require. You can easily obtain a balanced effect between the background and the top lighting by first turning off the background lights in the

Legs plus ventilation holes help cooling.



Even bulb spacing helps background uniformity.

White paper background caused shadows.



Light box background improved separation.

box and taking an incident-light reading of the subject illumination. Make the indicated exposure. Then, with the frontal lights off, take an incident-light reading of the background illumination and make the second exposure.

A word of caution: Don't overdo the background exposure, since you may cause an edge effect, or flare, which might impair the separation between the object and the background. In fact, to improve the subject's edge-to-background relationship, you may want to consider masking off with black paper the "extra" background area. Of course, the most convenient way to study this effect is with the help of an assistant who will alternately mask and unmask the background while you are checking the ground glass.

Polycontrast Story *(Continued from page 13)*

it is possible to control the contrast of Polycontrast Paper by a split-exposure method using only two filters and varying the relative exposure time for each filter. (This technique might also be useful for special effects; for example, when you wish to print one part of the subject in normal contrast and the remainder with either lower or higher contrast.) However, this should be done with gelatin filters because, otherwise, a double image may be formed on the print due to wedging. While the filters we supply in the Polycontrast Filter Kit are made of plastic in the interests of convenience and economy, they may cause the undesirable double-image effect if used for the cumbersome, split-exposure technique.

Finally, the use of the new Kodak OC Safelight is not only recommended but is almost imperative with these new papers (and can also be used for Kodak Medalist, Kodabromide, and Kodak Ektalure Papers). Because Polycontrast Papers depend on blue and yellow light for contrast control, safelights must be safe if this control is to be effective. This is because unsafe darkroom illumination *for any paper* can cause a reduction in print contrast even before the borders show any evidence of fog.

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you don't have to wait!

(*to judge color balance, that is*)

BEFORE Kodak Ektachrome Films or Kodak Color Print Materials, Types C and R, are dried, they are opalescent and somewhat difficult for an inexperienced operator to judge for color balance. We now have available a procedure that some of you may wish to use for judging wet pictures. We feel that it will be especially useful to those working with our color papers, as it will save time in allowing an operator to judge approximate color balance immediately and proceed with a color-corrected print, if required.

The procedure involves a treatment with Kodak Rapid Fixer used full strength (undiluted) but *without hardener solution*. Kodak Ektachrome Film is immersed in the Kodak Rapid Fixer for one minute immediately after treatment in the final Ektachrome Clearing and Fixing Bath. The transparency may then be judged for color balance. After judgment, the remainder of the processing is carried out normally. This includes the final wash and, for the E-2 process, the use of the stabilizing solution.

For Type C Paper, Process P-122, a one-minute immersion in Kodak Rapid Fixer follows step 7, which is the Hardener Fixing Bath. After judging the color balance, the print is then put through the remainder of the process — namely, steps 8 (wash — 16 minutes), 9 (hardener), 10 (wash), and 11 (buffer).

In the Process P-111 for Type R Paper, the immersion in Kodak Rapid Fixer follows step 11, which is the Hardener Fixing Bath. The remainder of the process involves changing the washing time from 10 to 20 minutes, followed by the stabilizing treatment and the water rinse.

Note that this procedure can be recommended for both kinds of color prints, provided the viewing time for judging the prints is reasonably short and the wash time which follows immediately is doubled.

Sales Service Division

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